Diet of Yellow Rail (*Coturnicops noveboracensis*) in the Rice Fields of Southwestern Louisiana

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Yellow Rail status in LA

- Winter resident, records spanning 20 Sep-1 May
- Prior to 1940's, mostly anecdotal records from SW prairie region and coastal zone
- Beginning 1943 discovered to be regular in substantial #'s in Baton Rouge area during Oct hay-cutting operations (high count 18 flushes in 3 hr on 23 Oct 1969). Sightings diminished by 1970's as technological advances allowed completion of hay harvest prior to arrival of YERA on wintering grounds
- Since November 1988 proven to be regular in substantial numbers in SW LA rice fields during second crop (ratoon) harvest Oct-Dec; also a few records during unusually late rice harvest activities in Red River Valley of northern and central LA (includes earliest arrival date of 20 Sep, Red River Parish)
- A few recent records from pine savanna habitat (coincidental with Henslow's Sparrow research)

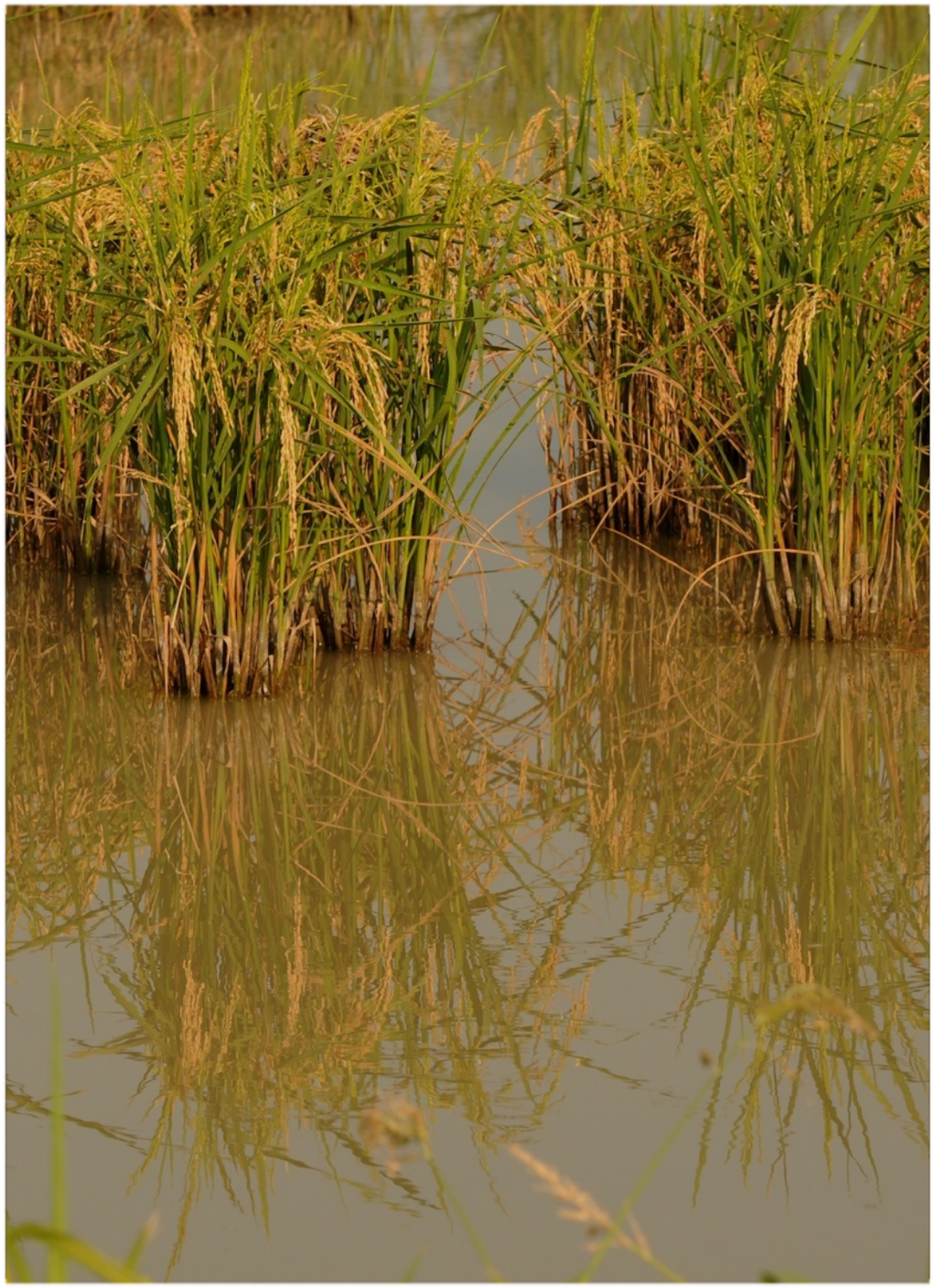
Rice cultivation/rotation

& the "second crop phenomenon" in southwest Louisiana

- late winter/early spring- prepare fields for planting
- Mar-May plant first crop (broadcast or drill)
- after sprouting, fields flooded to deter weed growth
- fields drained prior to harvest
- First crop typically harvested Jul-Aug
- **~25% of 1st crop acreage re-flooded to generate 2nd crop**
- fields drained prior to second harvest
- **Second (ratoon) crop harvest mid Oct-early Dec**
- stubble subsequently plowed (repeat rice or other crop), left fallow, or flooded for crawfish

Rice field habitat

Moist soil habitat with varying water levels: very dry to moist to standing water. Relatively thin soil layer over hard pan allows operation of heavy machinery



variation in cultivation techniques

how rice is planted:

broadcast from air or by tractor
= randomly distributed plants

versus....

drill by tractor
= equally spaced plants

drilled rice

planting technique driven by economics:
fuel costs, protection strategy against seed predation by birds, and weed control

Density of weeds:

grasses, sedges, & rushes

- within rice field
- bordering rice field

Caveat: not all fields created equal

Yellow Rail densities in SW LA rice fields

year	total YERA observed	area (ha)	YERA/ha (range)	YERA/ ha (mean)	available 2nd crop rice (ha)	est. YERA population in rice fields
2007	30	34	0.86-0.90	0.88		
2010	275	136	1.70-4.16	2.75	35,585	*60,495
2011	250	184	0.83-7.14	1.36	42,201	*35,027

--year 2010 was exceptional; more typical densities probably ≤ 1 YERA/ha

--some fields have zero YERA or very low densities (e.g., 0.2 YERA/ha) because too wet, too dry, or too open

* extrapolated population size in second crop rice based on that year's lowest density

ephemeral habitat

most rice harvested during second harvest mid October to early December

Harvested fields generally do not provide sufficient cover

WHILE IN RICE WHAT DO THEY EAT?

Stomachs collected from "recent material" collected or salvaged in rice field region of SW Louisiana over a 24 year period 1988-2012

Dates spanning: 11 October - 20 December

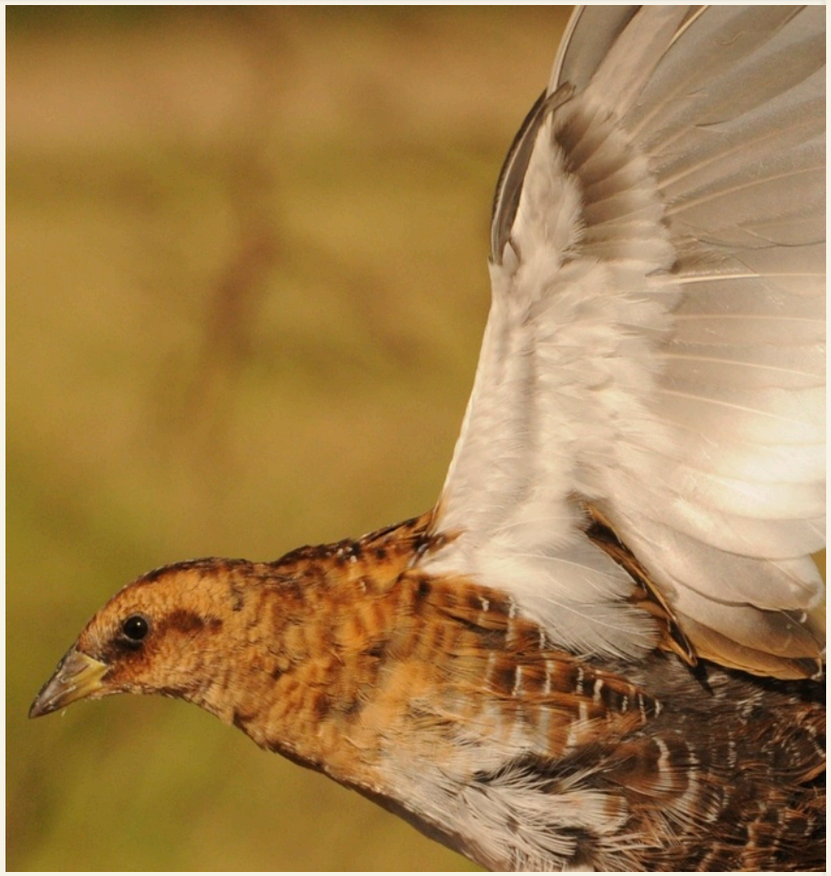
N = 47:

8	ad. males	28 males (60%)
19	im. males	
1	unsexed (= male, age?)	
		33 im. (70%)
5	ad. females	19 females (40%)
14	im. females	

--no analyses comparing age/sex classes, years, or early vs. late dates

Methods

- Most specimens initially frozen on dry ice.
- Thawed for skin preparation/autopsy
- Stomach contents saved in 70% ethanol.
- Fecal contents not examined/saved.



Contents examined using dissecting microscope (by SWC)

Identifiable contents sorted and counted

Identifiable contents placed in separate vial for subsequent re-analysis

So, what *do* fall-winter rice field Yellow Rails eat?

<u>Frequency (presence)among samples:</u>

Vegetable: 100%

- Seeds: 100%
- Leaves: trace

Animal: 94%

- Arthropods: 91%
- Snails: 57%

Mineral (grit): 62%

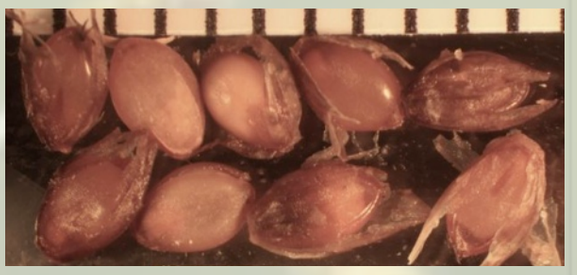
seed stats

- mean seed count/sample = 56 (range 1-449)

- mean # seed taxa/sample = 3 (range 1-9)

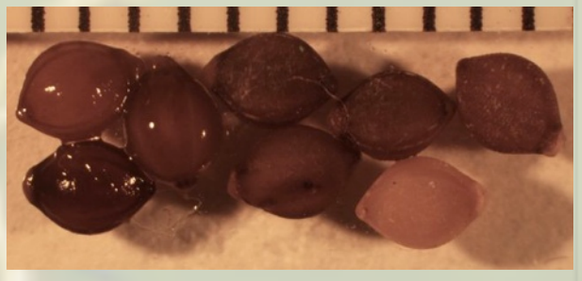
Panicum ssp.

Poaceae (possibly *Panicum*)



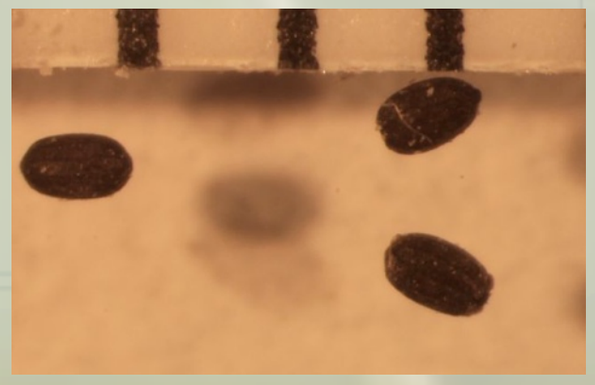
Panicum sp.

Panicum & *Setaria*



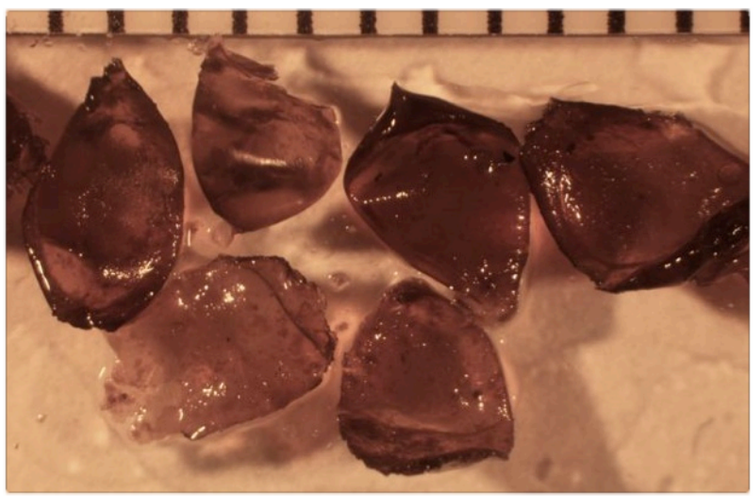
Rumex/Cyperus sp.

Unknown (possibly *Heteranthera*?)



Small seeds (non-rice; all $\leq$ 3-4 mm greatest dimension) present in 80% of all samples- predominantly grasses

Panicum, *Setaria*, and *Urochloa* spp.



unknown pods/seed coats

Rice (*Oryza* spp.)

--present in 70% of samples

--range 1-51 seeds/sample)

--19% of all samples contained *only* rice (27% of samples w/rice)

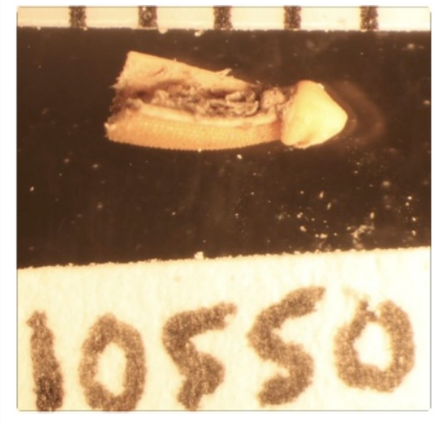
--In 30% of samples w/rice, > 50% of seeds were rice

Rice=

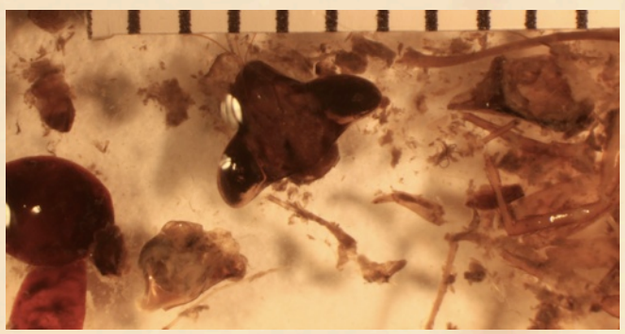
max seed size eaten:

<u>≤9 mm</u>

Counts of rice seeds based on presence of whole/partial seeds or seed calli (base); substantial amounts of partially digested seed husks, fragments, pulp, and fibers also usually present.



arthropods



--analysis incomplete, but detected in 91% of samples

--more arthropods than seeds in only 3 samples (6%)

--most remains fragmentary

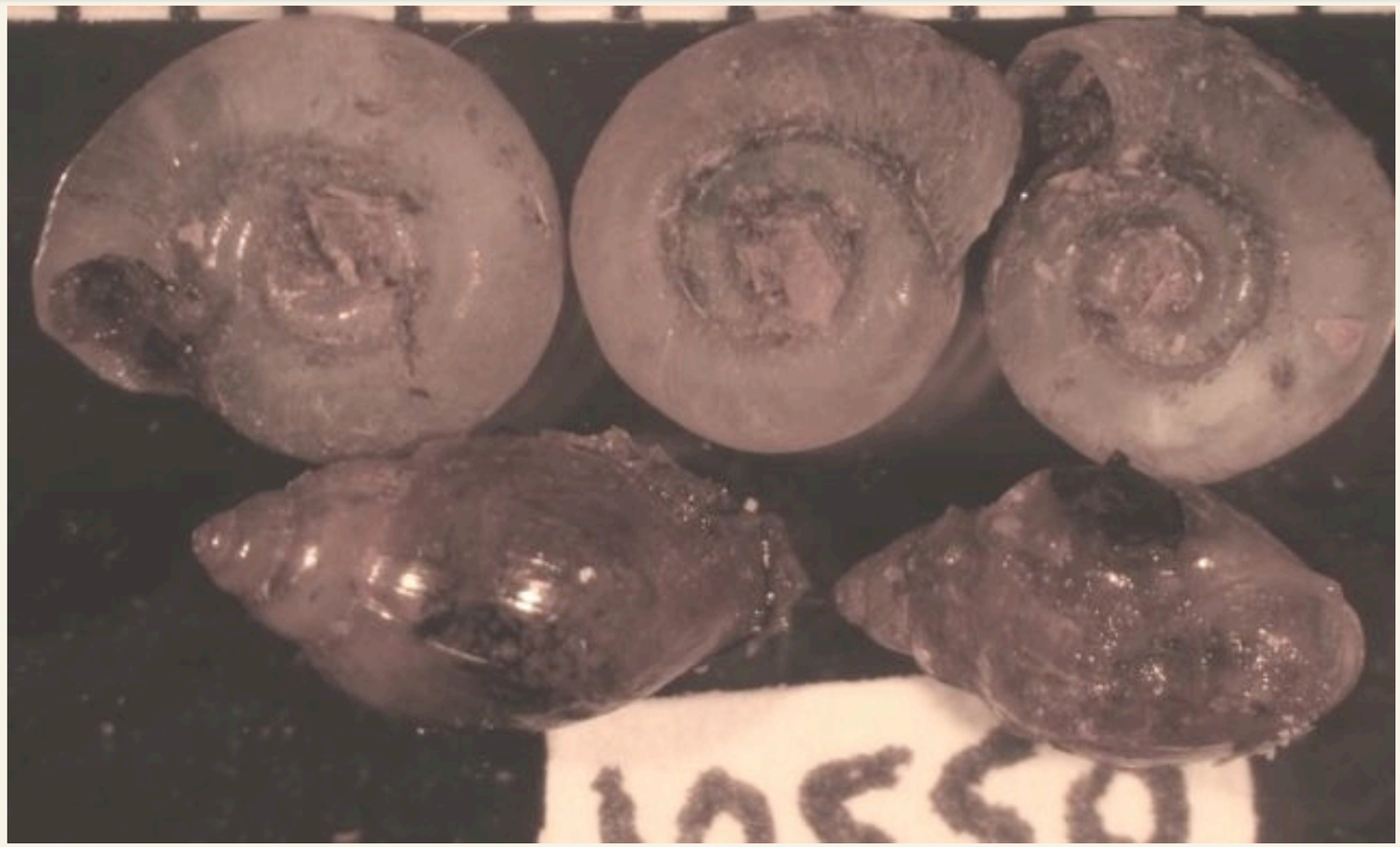
--most individuals only a few mm

--primarily beetles, mantids, spiders

--less frequently, Lepidoptera and Diptera larvae, traces of other taxa.

--surprisingly, no grasshoppers, true bugs or leafhoppers (except for one water bug), or crustaceans.

snails



- remains detected in 57% of samples, mainly crushed shell fragments
- whole/partial snails in ~25% of all samples, both conical and flat-spiral spp.
- average <2 intact snails/sample
- all individuals ≤ ~5 mm largest dimension
- do crushed snail shells supplement grit in aiding digestion of hard seeds?

Grit.... hard to come by in rice fields?

--present in 62% of samples

--amounts surprisingly small considering volume of whole seeds consumed

- mean = ~4 objects/sample (range 1-23)
- max. size from <1 mm up to ~5 mm

--87% of samples contained grit and/or snail remains

Do snail shell fragments assist in seed digestion?

Non-rice field samples

n = 3 (all salvaged)

- Holly Beach, Cameron Parish coast, 16 Oct, probable migrant.

> Digested seed mush; a few insect fragments; a few **snail** shell fragments; trace grit.

- Pecan Island, Vermilion Parish coast, 27 Oct, migrant/winterer.

> 2 small seeds (one taxon); trace insect fragments; ++ **snail** shell fragments.

- Iberville Parish south of Baton Rouge, pastureland east side Mississippi River, 16 Jan, winter resident.

> 17 seeds (3 taxa); **four terrestrial isopods** (**pillbugs**), largest 5 mm diameter; 10 whole or partial small **snails** (both conical and flat spiral), largest dimension 7 mm, ++ snail shell fragments; some plant pulp/fiber.

SUMMARY


Second crop rice habitat provides important cover and food resources for relatively large numbers of Yellow Rails during a potentially critical period of the annual cycle (arrival at wintering grounds, completion of pre-basic molt, etc.)


Analysis of stomach samples indicates that Yellow Rails found in SW LA rice fields Oct-Dec are omnivorous, preferring whole small seeds (mainly grass seeds, including rice) augmented with small invertebrates (mainly small insects and small snails)


Interestingly, rice seeds are a key component in diet


Clearly, YERA digestive tract can handle large quantities of whole, hard seeds..... may partly explain relatively small amounts of invert remains. Further study of YERA GI tract warranted.

Recommendations

- Second crop rice appears to be important for Yellow Rails, but there has been little intensive research. Need to spread awareness of the importance of rice and associated working wetlands to Yellow Rails and other species, and step-up research efforts, especially considering potential threats to rice agriculture including urban/suburban encroachment, competition for limited water resources, encroachment of sugar cane, etc.

- Track Yellow Rails after rice is cut.
- Leave some rice unharvested?
- More accurate extrapolations of pop size. Evenly distributed or patchy? Progressive concentrating effects as rice is harvested? Densities in non-rice habitat?
- Accumulate better data re harvest site parameters:
  rice variety, planting strategy, within-season field history, acreage, soil moisture, weed composition, YERA food resource availability, combine route, observer strategy (#, from combine or ground, etc.), YERA distribution within fields, year-to-year comparisons.
- Continue to accumulate winter diet info from rice and other habitats.

acknowledgments

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- info on rice acreage: Randy Jemison, USA Rice Federation, and Johnny Saichuck, LSU AgCenter;
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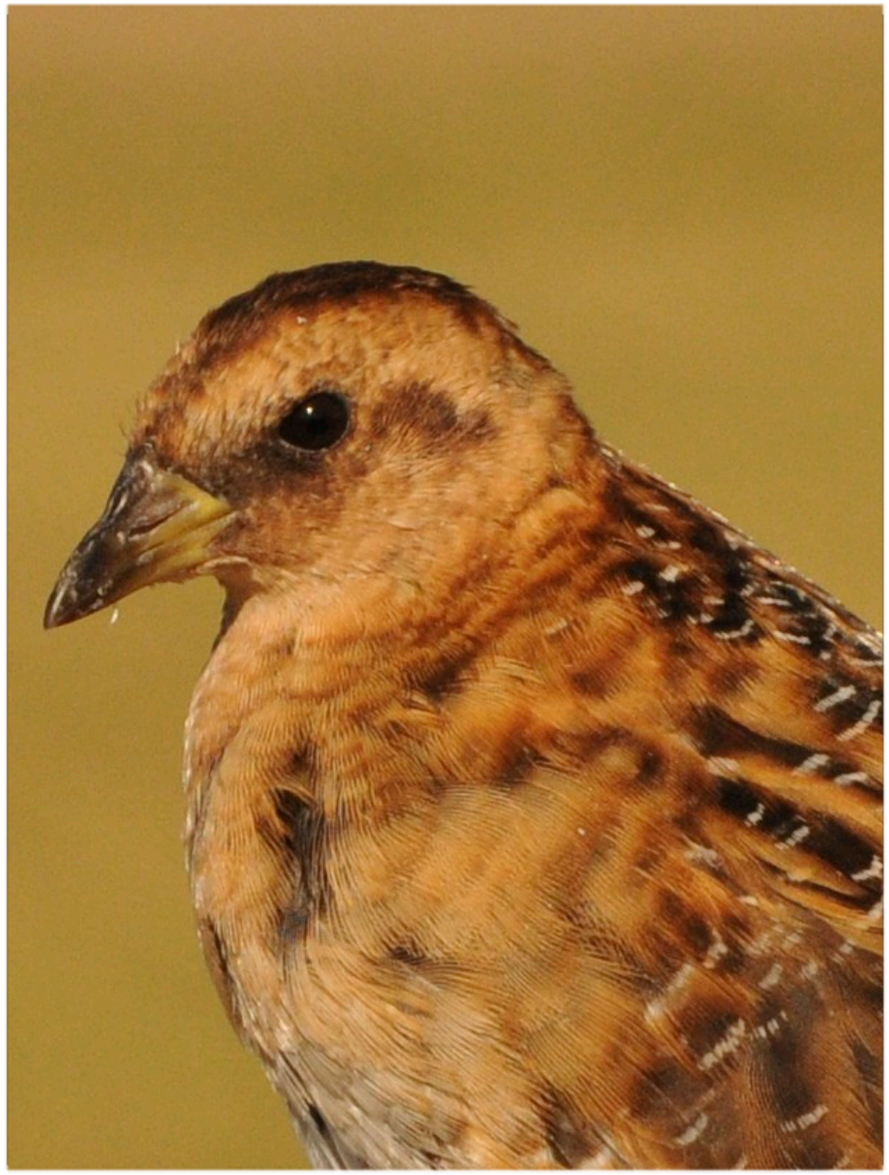
- KMB Farms, Richard Guillory, Berken Brothers Farms, Clarence & Stephen Berken, Bayou Land Farms, and Edward Wild & Sons Farms; Dale Hughes Farm
- friends, Kevin, Shirley and Adam Berken.



YELLOW RAILS & RICE FESTIVAL

Yellow Rails and Rice Festival

The Yellow Rails and Rice Festival 2013

Visit past festivals:

YRARF 2009 photos
YRARF 2010 photos
YRARF 2011 photos
YRARF 2012 photos

YRARF 2013

Centrally located, YRARF 2013 is based in Jennings, LA

Festival updates

A festival like no other....

The fifth annual Yellow Rails and Rice Festival is scheduled for 23-27 October 2013. Designed with fun in mind, its primary goal is to provide participants a unique venue to view Yellow Rails while at the same time bringing birders and farmers together to realize the value to birds of the area's "working wetlands." The festival schedule is casual and participants can attend all field days (weather permitting) or come and go at their leisure. Leaders/facilitators are positioned at field sites and help participants spot birds as well as provide information or answer questions. In addition to visiting rice fields, participants can explore nearby birding areas, join trips to local points of interest, or venture farther afield to search for specialty birds in other Louisiana habitats, such as the pineywoods or Cameron Parish coast. Many of the agencies and organizations that study, manage, and protect Louisiana's birds and habitats assist at the festival, as well as have information booths during the opening reception (icons displayed below) so that participants can learn more about their activities. A banding workshop is

BIRD BANDING WORKSHOP. Join Dr. Erik I. Johnson for an introduction to bird banding, learn how to assess molt, age, and sex of birds in the hand. Indoor workshop Thursday evening followed by field sessions Friday and Saturday. Click on rail for more detailed description.
Additional fee.

Also offered...a banding workshop lead by Erik Johnson